



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/964,827	09/25/2001	Enrique Musoll	P3842	3478
23669	7590	12/14/2005	EXAMINER	
HUFFMAN LAW GROUP, P.C. 1832 N. CASCADE AVE. COLORADO SPRINGS, CO 80907-7449			SHIN, KYUNG H	
			ART UNIT	PAPER NUMBER
			2143	
DATE MAILED: 12/14/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/964,827

Applicant(s)

MUSOLL ET AL.

Examiner

Kyung H. Shin

Art Unit

2143

– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 July 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-9,11-15,17 and 18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-9,11-15,17 and 18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 6/29,30/05
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. This action is responding to application papers filed 7/28/2005.
2. Claims 1, 2, 4-9, 11-15, 17, 18 are pending. Claims 1, 2, 7, 8, 9, 13 have been amended. Claims 3, 10, 16, 19 - 28 have been canceled. Independent claims are 1, 8, 13.

Response to Arguments

3. Applicant's arguments with respect to claims 1, 2, 4-9, 11-15, 17, 18 have been considered but are moot in view of the new ground(s) of rejection.

- 3.1 Applicant argues that the referenced prior art does not disclose: "...

continually selecting the best mapping scheme to enable data storage with minimum fragmentation ... " (Remarks Page 3, Lines 12-14) The Kalkunte prior art in view of the Walls prior art discloses the capability to utilize a mapping scheme for data storage to minimum fragmentation. (see Walls col. 5, lines 18-23; col. 6, line 64 - col. 7, line 9; col. 4, lines 61-64: memory management scheme utilizing a list (i.e. mapping scheme) for data storage and to reduce fragmentation)

- 3.2 Applicant argues that the referenced prior art does not disclose: "...

handling packets of varying sizes by evaluating the size of incoming packets and resizing the memory units to minimize fragmentation ... " (Remarks

Page 3, Lines 18-19). The Kalkunte prior art disclose the evaluation of incoming packets to determine whether space exists to store packets within CBP (i.e. LPM) or GBP (i.e. EPM). (see Kalkunte col. 15, lines 5-11; col. 15, lines 44-46: low watermark threshold, CBP (i.e. LPM) limit - high watermark threshold, GBP (i.e. EPM) limit) The Kalkunte prior art in view of the Walls prior art discloses the capability to evaluate the size of incoming packets to determination placement within memory and to resize memory units minimizing fragmentation. (see Walls col. 5, lines 18-23; col. 6, lines 16-19; col. 6, line 64 - col. 7, line 9; col. 4, lines 61-64: memory unit size utilized in order to resize memory units and reduce fragmentation)

Claim Rejection - 35 USC § 103

The text of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. **Claims 1, 2, 6 - 9, 13, 14, 17, 18** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Kalkunte et al.** (US Patent No. 6,813,268) in view of **Walls** (US Patent 5,675,790).

Regarding Claim 1 (Currently Amended), Kalkunte discloses a system for managing packets incoming to a data router comprising:

- b) an external packet memory (EPM) for storing overflow data which is not storable by said LPM; (see Kalkunte col. 6, lines 43-50; col. 15, lines 5-11; col. 15, lines 44-46: GBP (Global memory Buffer Pool) utilizing external memory, determination whether packets will fit within CBP (i.e. LPM) or GBP (i.e. EPM))
- c) a first storage system coupled to said LPM, to determine the size of said packets to be stored in said LPM, and for determining whether said packets can be stored in said LPM; (see Kalkunte col. 6, lines 26-30; col. 6, lines 50-52; col. 15, lines 5-11; col. 15, lines 44-46: CBP, a first storage system, determination whether packets will fit within CBP (i.e. LPM) or GBP (i.e. EPM)) and
- d) a second storage system coupled to said first storage system, for receiving an indication from said first storage system when it cannot store said packets in said LPM, and for storing said packets in said EPM; (col. 6, lines 43-50; col. 15, lines 5-11; col. 15, lines 44-46: GBP, a second storage system, determination (i.e. indication) whether packets are to be stored within GBP (i.e. EPM))
- e) wherein said first storage system attempts to store all said packets in said LPM, and for those packets that are not storable within said LPM, relinquishes control to said second system, which stores said packets in said EPM (see Kalkunte col. 15, lines 12-58; col. 34, lines 18-29; col. 15, lines 5-11; col. 15, lines 44-46: criteria for packet storage in Common Buffer Pool (Local Packet Memory) or Global Buffer Pool (External Packet Memory), determination whether packets are stored within CBP (i.e. LPM) or GBP (i.e. EPM)), and

Art Unit: 2143

Kalkunte discloses a local packet memory (LPM) mapped into preconfigured memory units, to store packets for processing, (see Kalkunte col. 6, lines 26-30; col. 6, lines 32-34: CBP (Common Buffer Pool) network switch local packet memory utilizing buffers (pre-configured memory units)) Kalkunte does not disclose memory unit resize capability to minimize fragmentation. However, Walls discloses:

- a) wherein, each of said pre-configured memory units being resizable by said system; (see Walls col. 5, lines 18-23; col. 6, lines 16-19; col. 6, line 64 - col. 7, line 9: memory unit size utilized to resize memory units)
- f) wherein said system evaluates the size of said pre-configured memory units based on the size of said packets, and resizes said memory units to minimize fragmentation. (see Walls col. 5, lines 18-23; col. 6, lines 16-19; col. 6, line 64 - col. 7, line 9; col. 4, lines 61-64: memory unit size utilized to resize memory units and reduce fragmentation)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kalkunte to enable memory unit resizing capabilities to minimize fragmentation as taught by Walls. One of ordinary skill in the art would be motivated to employ Walls in order to efficiently enable dynamic memory availability eliminating unnecessary overhead. (see Walls col. 3, lines 46-48: “ ... *dynamic memory is available quickly and efficiently with a minimum of unnecessary overhead or extended wait periods ...* ”)

Art Unit: 2143

Regarding Claim 2 (Currently Amended), 9 (Currently Amended), Kalkunte discloses the system of claim 1 wherein said storage system is hardware controlled and said second storage system is softwarecontrolled. (see Kalkunte col. 6, lines 26-27: first storage system on-chip data memory (hardware controlled) col. 6, lines 54-56: second storage system is controlled by PMMU programmed unit (software controlled))

Regarding Claim 6, 17, Kalkunte discloses the system of claim 2 wherein the first storage system is implemented as an integrated circuit (IC) or IC chip set. (see Kalkunte col. 6, lines 26-30: first storage system, CBP, is on-chip data memory)

Regarding Claim 7 (Currently Amended), Kalkunte discloses the system of claim 1 wherein said first storage system provides a memory address to said second storage system if said packets cannot be stored in said EPM. (see Kalkunte col. 33, lines 26-37; col. 6, lines 50-52; col. 15, lines 5-11; col. 15, lines 44-46: Direct Memory Address (DMA) provides direct addresses for memory access, PMMU interfaces second storage system, determination whether packets can be stored in EPM)

Regarding Claim 8 (Currently Amended), Kalkunte discloses a data packet router comprising:

- a) external ports to receive and send data packets from and to neighboring connected routers; (see Kalkunte col. 4, lines 12-16; col. 10, line 66 - col. 11, line 2: ingress (input) and egress (output) ports provided for network switch) and

b) a system, coupled to said external ports, for managing said packets incoming to

a data router, the system comprising:

- ii) an external packet memory (EPM) for storing overflow data which is not storable by said LPM; (see Kalkunte col. 6, lines 43-50; col. 15, lines 5-11; col. 15, lines 44-46: Global memory Buffer Pool utilizing external memory, determination whether packets are to be stored within GBP (i.e. EPM)),
- iii) a first storage system coupled to said LPM, to determine the size of said packets to be stored in said LPM, for determining whether said packets can be stored in said LPM, and to store packets in said LPM; (see Kalkunte col. 6, lines 26-30; col. 6, lines 50-52; col. 15, lines 5-11; col. 15, lines 44-46: CBP, a first storage system, determination whether packets are to be stored within CBP (i.e. LPM))
- iv) a second storage system coupled to said first storage system, for receiving an indication from said first storage system when it cannot store said packets in said LPM and storing said packets in said EPM; (see Kalkunte col. 15, lines 5-11; col. 15, lines 44-46: determination whether packets stored within GBP (i.e. EPM))
- v) wherein said first storage system attempts to store all said packets in said LPM, and for those packets that are not storable within said LPM, relinquishes control to said second system, which stores said packets in said EPM (see Kalkunte col. 15, lines 12-58; col. 34, lines 18-29; col. 15, lines 5-11; col. 15, lines 44-46: criteria for data packet storage in CBP (i.e.

LPM) or GBP (i.e. EPM), determination whether packets stored in GBP (i.e. EPM)), and

Kalkunte discloses a local packet memory (LPM) mapped into preconfigured memory units (see Kalkunte col. 6, lines 26-30; col. 6, lines 32-34: Common Buffer Pool within network switch utilizing local packet memory comprised of buffers (pre-configured memory units)), to store packets for processing. Kalkunte does not disclose resizing memory units for efficient memory management and to reduce fragmentation. However, Walls discloses:

- i) wherein, each of said pre-configured memory units being resizable by said system; (see Walls col. 5, lines 18-23; col. 6, lines 16-19; col. 6, line 64 - col. 7, line 9; col. 4, lines 61-64: memory unit size utilized to resize memory units and reduce fragmentation)
- vi) wherein said system evaluates the size of said pre-configured memory units based on the size of said packets, and resizes said memory units to minimize fragmentation. (see Walls col. 5, lines 18-23; col. 6, lines 16-19; col. 6, line 64 - col. 7, line 9; col. 4, lines 61-64: memory unit size utilized to resize memory units and reduce fragmentation)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kalkunte to enable memory unit resizing capabilities to minimize fragmentation as taught by Walls. One of ordinary skill in the art would be motivated to employ Walls in order to efficiently

enable dynamic memory availability eliminating unnecessary overhead.

(see Walls col. 3, lines 46-48)

Regarding Claim 13 (Currently Amended), Kalkunte discloses a method for managing packets incoming to a data router, comprising the steps of:

- b) relinquishing packets not storable within the LPM to a second storage system;
(see Kalkunte col. 15, lines 5-11; col. 15, lines 44-46: determination whether packets are stored within LPM or EPM)
- c) storing the packets not storable within the LPM in an external packet memory by a second storage system. (see Kalkunte col. 15, lines 12-58; col. 34, lines 18-29: criteria for packet storage in CBP (LPM) or GBP (EPM)), and

Kalkunte discloses attempting to store all incoming packets, by a first storage system, into a local packet memory (LPM) that is mapped into preconfigured but resizable memory units; (see Kalkunte col. 6, lines 26-30; col., 6, lines 32-34: Common Buffer Pool within network switch utilizing local packet memory comprised of buffers (pre-configured memory units)). Kalkunte does disclose the capability to resize memory units and reduce fragmentation. However, Walls discloses:

- a) wherein, memory mapped into preconfigured but resizable memory units; (see Walls col. 5, lines 18-23; col. 6, lines 16-19; col. 6, line 64 - col. 7, line 9: memory unit size utilized to resize memory units)

- d) examining the size of the packets to determine whether the memory units should be resized to reduce fragmentation. (see Walls col. 5, lines 18-23; col. 6, lines 16-19; col. 6, line 64 - col. 7, line 9; col. 4, lines 61-64: memory unit size utilized to resize memory units and reduce fragmentation)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kalkunte to enable memory unit resizing capabilities to minimize fragmentation as taught by Walls. One of ordinary skill in the art would be motivated to employ Walls in order to efficiently enable dynamic memory availability eliminating unnecessary overhead. (see Walls col. 3, lines 46-48)

Regarding Claim 14, Kalkunte discloses the method of claim 13 wherein the first storage system is hardware controlled and the second storage system is software controlled. (see Kalkunte col. 6, lines 26-27: first storage system on-chip data memory (hardware controlled) col. 6, lines 54-56: second storage system is controlled by PMMU programmed unit (software controlled))

Regarding Claim 18, Kalkunte discloses the method of claim 17 wherein in step (c) the second storage system is softwarecontrolled. (see Kalkunte col. 6, lines 43-52: GBP, second storage system - PMMU (programmed) interface for controlling external memory)

5. **Claims 4, 5, 11, 12, 15** are rejected under 35 U.S.C. 103(a) as being unpatentable

over **Kalkunte-Walls** in view of **Tarditi** (US Patent No. 6,625,808).

Regarding Claim 4, 11, Kalkunte does not disclose the data router operational over the Internet. However, Tarditi discloses the system of claims 1, 8, wherein the data router is connected to and operates on the Internet. (see Tarditi col. 7, lines 43-57: data packet router operational over Internet networks)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kalkunte to operate over multiple types of networks such as the Internet as taught by Tarditi. One of ordinary skill in the art would be motivated to employ Tarditi in order to expand communications between network devices including routers over commonplace networking environments. (see Tarditi col. 7, lines 35-47: “*... a router or other network device ... a local area network (LAN) 180 and a wide area network (WAN) 182 ... commonplace in offices, enterprise-wide computer networks, Intranets, and the Internet ...*”)

Regarding Claim 5, 12, 15, Kalkunte does not disclose the data router operational over a corporate wide-area-network. However, Tarditi discloses the system of claims 1, 8, 13, wherein the data router is connected to and operates on a corporate wideareanetwork (WAN). (see Tarditi col. 7, lines 43-57: data packet router operational over corporate wide area networks (enterprise-wide computer networks))

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kalkunte to operate over multiple types of networks such

Art Unit: 2143

as the Internet as taught by Tarditi. One of ordinary skill in the art would be motivated to employ Tarditi in order to expand communications between network devices including routers over commonplace networking environments. (see Tarditi col. 7, lines 35-47)

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kyung H. Shin whose telephone number is (571) 272-3920. The examiner can normally be reached on 9 am - 7 pm.

Art Unit: 2143

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David A. Wiley can be reached on (571) 272-3923. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KHS
Kyung H Shin
Patent Examiner
Art Unit 2143

KHS
September 12, 2005

A handwritten signature in black ink, appearing to read "Wm. C. Vaughn, Jr.", with a large, stylized flourish at the end.

WILLIAM C. VAUGHN, JR.
PRIMARY EXAMINER